

WHAT IS CLAIMED IS:

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1. A process for the preparation of acetic acid and/or methyl acetate in the liquid phase by the carbonylation of methanol and/or the isomerization of methyl formate in the presence of water, a solvent, a homogeneous catalyst system comprising iridium and a halogen-containing promoter, and carbon monoxide, wherein said catalyst system also comprises platinum.

2. The process as claimed in claim 1 which is a process for the carbonylation of methanol wherein a carbon monoxide partial pressure of between $0.1 \cdot 10^5$ Pa and $200 \cdot 10^5$ Pa is maintained throughout the reaction.

3. The process as claimed in claim 1 which is a process for the isomerization of methyl formate wherein a carbon monoxide partial pressure of between $0.1 \cdot 10^5$ Pa and $25 \cdot 10^5$ Pa is maintained throughout the reaction.

4. The process as claimed in claim 1 which comprises a methanol carbonylation reaction and a methyl formate isomerization reaction simultaneously and is carried out under a carbon monoxide partial pressure of between $0.1 \cdot 10^5$ Pa and $25 \cdot 10^5$ Pa throughout the reaction.

5. The process as claimed in one of claims 1 to 4 wherein the platinum is introduced into said catalyst system in the form of platinum in the metallic state, a platinum salt or an oxide.

6. The process as claimed in one of claims 1 to 4 wherein the platinum is introduced into the catalyst system in the form of a coordination complex, preferably a coordination complex of this metal with ligands selected from carbon monoxide, a carbon monoxide/halogen combination and organonitrogen and organophosphorus compounds.

7. The process as claimed in claim 6 wherein said complex is $[\text{PtI}_2(\text{CO})]_2$.

8. The process as claimed in claim 5 wherein a platinum concentration of at least 4 mmol/l of reaction medium and an atomic ratio of iridium to platinum of between 2 and 5 are maintained.

9. The process as claimed in claim 6 or 7 wherein a platinum content of at least 1 mmol/l of reaction medium and an atomic ratio of iridium to platinum of between 1 and 5 are maintained.

10. The process as claimed in one of claims 1 to 7 wherein said catalyst system also contains rhodium.

11. The process as claimed in claim 10 wherein the atomic ratio of rhodium to

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iridium is between 0.01 and 99.

12. The process as claimed in claim 10 or 11 wherein the platinum is introduced into the catalyst system in the form of platinum in the metallic state, a platinum salt or a platinum oxide, and a platinum content of at least 4 mmol/l of reaction medium and an atomic ratio of (iridium + rhodium) to platinum of between 2 and 5 are maintained.

13. The process as claimed in claim 10 or 11 wherein the platinum is introduced in the form of a coordination complex as defined in one of claims 6 or 7, and a platinum content of at least 1 mmol/l of reaction medium and an atomic ratio of (iridium + rhodium) to platinum of between 1 and 5 are maintained.

14. The process as claimed in one of claims 1 to 13 wherein a concentration of iridium and, if appropriate, iridium and rhodium in the reaction medium of between 0.1 and 100 mmol/l, preferably of between 1 and 20 mmol/l, is used.

15. The process as claimed in one of claims 1 to 14 which is carried out in the presence of a water content less than or equal to 14% by weight, based on the total weight of the reaction medium, and preferably a content less than or equal to 10% by weight.

16. The process as claimed in claim 15 wherein only the carbonylation of methanol is carried out and this is done in the presence of a water content of between 2 and 8% by weight of the reaction medium.

17. The process as claimed in claim 15 which involves a methyl formate isomerization reaction and, if appropriate, a simultaneous methanol carbonylation reaction and this is carried out in the presence of a water content of less than 5% and preferably of less than 2% by weight of the reaction medium.

18. The process as claimed in one of claims 1 to 17 wherein said halogen-containing promoter can be the halogen by itself or can comprise hydrogen or a methyl or acetyl radical.

19. The process as claimed in claim 18 wherein said halogen-containing promoter is methyl iodide.

20. The process as claimed in one of claims 1 to 19 which is carried out in the presence of a content of halogen-containing promoter less than or equal to 20% by weight, based on the total weight of the reaction mixture, and preferably less than 15%.

21. The process as claimed in one of claims 1 to 20 which is carried out in the presence of an ester content of less than 40% by weight, based on the total weight

$$a^3$$

35

1) for
Corn
Seed
A 3

Add 1
a 4

of the reaction mixture, and preferably of less than 30%.

22. The process as claimed in one of claims 1 to 21 wherein iodides are introduced into the reaction medium in proportions such that the atomic ratio of soluble iodides introduced into the reaction medium to iridium is kept below 10.

5 23. The process as claimed in any one of claims 1 to 22 which is carried out continuously.